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NOTES ON AMERICAN LESPEDEZAS.

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THE following notes on bush clovers may be prefaced by a short account of the papers which have contributed most materially to our knowledge of the American forms of *Lespedeza*. The first good general treatment was that in Torrey and Gray's "Flora of North America."¹ In this the importance of the apetalous flowers in classification was pointed out for the first time, and the species were divided into the two primary groups which have been retained by all later writers. The synonymy of several species was corrected on the basis of Dr. Gray's investigations of type material, and a good foundation laid for subsequent study of the group. The specific units in this treatment were too broadly conceived, however, and the improvements introduced in Torrey and Gray's scheme by later authors have been mainly in the direction of a closer delimitation of species.

For more than half a century little change was made in Torrey and Gray's treatment. Maximowicz's² revision of the genus, published in 1873, followed in general the work of Torrey and Gray for the American species. *L. violacea* and *L. reticulata* (= *L. virginica*), which had been considered conspecific by Torrey and Gray, were separated, *L. repens* and *L. procumbens* were united under the name *L. repens*, and *L. capitata* var. *angustifolia* Pursh was transferred to varietal rank under *L. hirta*. In 1876 Gray,³ in connection with the

¹ Fl. N. Amer. **1**: 366-369. 1840.

² Act. Hort. Petrop. **2**: 327-388. 1873.

³ Proc. Amer. Acad. **12**: 57. 1876.

publication of the unique *Lespedeza leptostachya* Engelm., treated *Lespedeza angustifolia* as specifically distinct from *L. capitata*, and briefly noted the diagnostic characters of the species of the *L. hirta* group.

Our present-day concept of the American species is based mainly on Britton's paper "The North American species of the genus *Lespedeza*,"¹ published in 1893. All of the twelve species here described are now generally adopted under the names used by Dr. Britton, with the single exception of *L. intermedia*, now called *L. frutescens*; and in this case, as shown further on (see no. 5), it is necessary to return to the name *L. intermedia*, in place of *L. frutescens* proposed by Britton in 1894. The account of "The *Lespedezas* of Missouri," published in 1902 by Mackenzie and Bush,² followed Britton's treatment rather closely, but contained descriptions and figures of three new species and a new variety, while a variety already proposed by Britton was raised to specific rank.

The last important contribution to the knowledge of American *Lespedezas* is contained in A. K. Schindler's "Einige Bemerkungen über *Lespedeza* Michx. und ihre nächsten Verwandten,"³ which is based on work in the herbaria at London and Paris, as well as at Berlin. The nomenclature of several of the American species is discussed critically, after examination of the type specimens, and a table is given showing the modern equivalents of the names used in practically all papers of any importance referring to the genus. Latin descriptions of most of the American species are given, and attention is called to some differences in floral structure not sufficiently appreciated hitherto. The most novel fact brought out in Schindler's treatment is the occurrence of cleistogamous flowers in the group composed of *L. hirta* and related forms, which had previously been characterized in part by the supposed absence of such flowers.

1. *LESPEDEZA PROCUMBENS* var. **elliptica**, var. nov. Leaflets narrowly elliptic, nearly or quite four times as long as wide, the larger 1.8–3.4 cm. long, 4–9 mm. wide; otherwise similar to the typical form.

SPECIMENS EXAMINED: VIRGINIA: In dry meadow, near Lorton, Fairfax Co., 16 Sept. 1923, *S. F. Blake* 8621 (TYPE no. 1,111,347,

¹ Trans. N. Y. Acad. Sci. **12**: 57–68. 1893.

² Trans. Acad. Sci. St. Louis **12**: 11–19. pl. 1–4. 1902.

³ Bot. Jahrb. **49**: 570–658. 1913.

U. S. National Herbarium; duplicate in the Gray Herbarium); same locality, 3 Oct. 1923, *Blake* 8653 (U. S., Gray, N. Y. Bot. Gard.); Point of Rocks, near Avoca, Altavista, Campbell Co., 7 Sept. 1913, *Juliet Fauntleroy* 632 (U. S.). ALABAMA: Near Mountain Home, Lawrence Co., 23 Sept. 1892, *C. Mohr* (U. S.).

In its numerous procumbent stems, up to 125 cm. long, its dense short spreading pubescence, its long-peduncled racemes of petaliferous flowers, its flower structure, and its pods, this plant agrees with typical *Lespedeza procumbens* Michx. In that plant, as shown by Michaux's

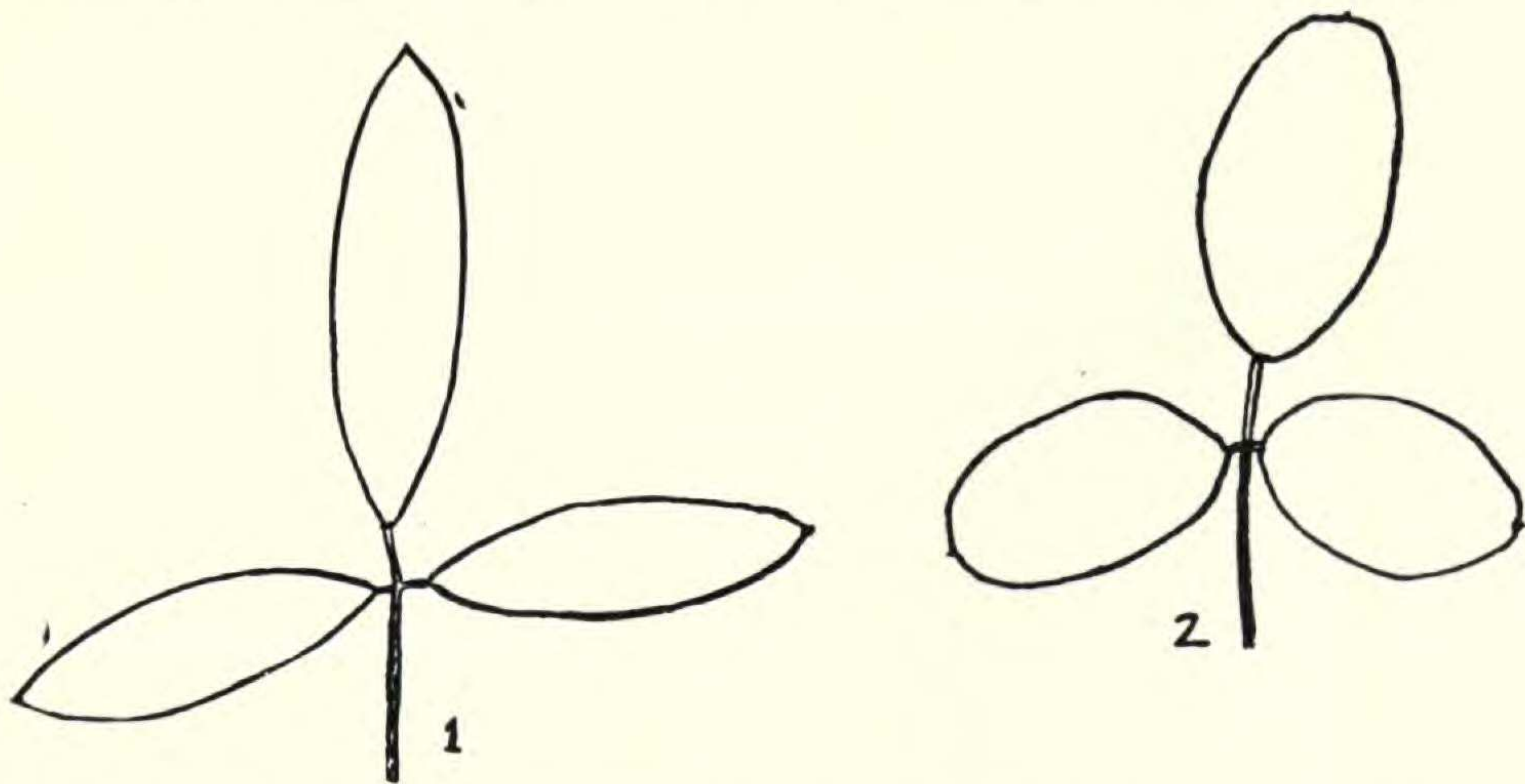


FIG. 1. Leaf of *L. procumbens* v. *elliptica* (Blake 8621) \times 1.

FIG. 2. Leaf of *L. procumbens* (Bush 40) \times 1.

original plate and by a long series of specimens, the leaflets are oval, not more than twice as long as wide, the larger 1.2–2.5 cm. long by 7–15 mm. wide. No specimens really intermediate between the typical form and the variety here described as new have been examined.

Lespedeza acuticarpa Mackenzie & Bush, Trans. Acad. Sci. St. Louis **12**: 16. *pl.* 3. 1902, from Missouri, appears to be related to *L. procumbens* var. *elliptica*. I have not seen the type collection, *Mackenzie* 449, but the specimen in the National Herbarium of *Bush* 67, the second number cited, is similar in most respects to var. *elliptica*. The plant is described as erect or suberect, while var. *elliptica* is truly procumbent or prostrate. Of later specimens in the National Herbarium distributed by Bush under the name *L. acuticarpa*, one sheet (*Bush* 6524) is *L. Stuevei* Nutt., while another (*Bush* 7886) is *L. intermedia* (Wats.) Britton.

2. *LESPEDEZA VIOLACEA* var. *PRAIREA* Mackenzie & Bush, Trans. Acad. Sci. St. Louis **12**: 14. *pl.* 1. 1902.—*Lespedeza prairea* Britton;

Small, Fl. S. E. U. S. ed. 1. 641, 1332. 1903.—This variety, originally distinguished from *L. violacea* by its smaller size, non-paniculate inflorescence, and much shorter pedicels, was raised to specific rank in Small's "Flora of the Southeastern United States", and separated in Small's key from *L. violacea* by its elongated peduncles, lax inflorescence, and shorter calyx lobes (about $\frac{1}{4}$ as long as the pod), *L. violacea* being distinguished by its short peduncles, close inflorescence, and calyx lobes about $\frac{1}{2}$ as long as the pod. Inasmuch as the long peduncles of *L. violacea* are one of its fundamental characters, it is difficult to consider them as distinctive of *prairea*. The difference in length of calyx lobes compared with the pod rests on no better foundation, since the short calyx lobes are those characteristic of the apetalous flowers, and the longer calyx lobes those of the petaliferous flowers. The greater part of the material of *L. violacea* in the National Herbarium from throughout the range of the species has the short calyx supposed to be characteristic of *L. prairea*. In this species the petaliferous flowers seem to perfect fruit only rarely.

The smaller leaflets and shorter pedicels ascribed to *L. violacea* var. *prairea* in the original description are not of any more real consequence than the characters already discussed. Although the type number (*Bush* 93) and a few other specimens from Missouri have small leaflets (2 cm. long or less), they differ in no other way from *L. violacea*. A variety based on such a character, particularly when this reduction in size of leaflets can with much probability be associated with the difference in habitat (var. *prairea* being, according to Mackenzie & Bush, a plant of dry prairies, while *L. violacea*, according to the same authors, is found in rocky woods), seems altogether too artificial to be maintained. Later collections (*Bush* 3288 and 5108) distributed by Bush as *L. prairea* have leaflets 2–3 cm. long and are in no way distinguishable from ordinary *L. violacea* (L.) Pers. Schindler¹ refers *L. violacea prairea* to *L. violacea* without discussion.

3. LESPEDEZA STUEVEI Nutt. Gen. 2: 107. 1818.—The name of this species has almost universally been written *Lespedeza Stuevei*. It was published by Nuttall in the form "*Stüvei*," which should be transcribed "*Stuevei*" in accordance with Recommendation XI. c of the International Rules, as is done by Schindler. The species was

¹ Bot. Jahrb. 49: 613. 1913.

dedicated by Nuttall to "the memory of my friend W. Stuve, M. D., of Bremen, who discovered it."

4. *LESPEDEZA STUEVEI* var. *ANGUSTIFOLIA* Britton, Trans. N. Y. Acad. Sci. **12**: 63. 1893 (as *Stuvei*).—*Lespedeza Stuvei neglecta* Britton, Mem. Torr. Bot. Club **5**: 206. 1894. *Lespedeza neglecta* Mackenzie & Bush, Trans. Acad. Sci. St. Louis **12**: 17. 1902.—The new name *L. Stuvei neglecta* was given by Britton on account of the earlier *L. angustifolia* (Pursh) Ell., but this change is not required by either the International or the American Rules, under both of which *L. Stuevei* var. *angustifolia* is valid for the plant in its varietal rank.

The status of this form is problematical. In the densely short-pilose or almost tomentose stems and under leaf-surface it agrees with *L. Stuevei*, but the habit and the shape of the leaflets are essentially those of *L. virginica*, and it is possible that it represents a hybrid between these two species. In the original description the range of var. *angustifolia* was given as from New Jersey and Pennsylvania to North Carolina, Missouri, and Texas. Through the kindness of Dr. N. L. Britton, I have been able to examine two sheets of the original material, one from the pine barrens of New Jersey, without collector's name, marked "assigned type" by Dr. Britton, and one collected in the vicinity of Heilig's Mill P. O., Rowan Co., North Carolina, 13–18 Aug. 1891, by J. K. Small and A. A. Heller. There are two sheets in the National Herbarium, one collected at Knoxville, Tennessee, July 1898, by A. Ruth (no. 311), the other collected near Waldorf, Charles Co., Maryland, 30 Sept. 1923, by S. F. Blake (no. 8639). Another sheet of specimens collected at Coulterville, Illinois, 25 Aug. 1914, by W. H. Emig (no. 242), is so nearly intermediate between this plant and *L. virginica* that it is difficult to decide its proper position.

5. *LESPEDEZA FRUTESCENS* (L.) Britton, Mem. Torr. Bot. Club **5**: 205. 1894.—This name, based on *Hedysarum frutescens* L. Sp. Pl. **2**: 748. 1753, has for some years been in practically universal use for a common bush clover of the eastern United States closely related to *L. virginica*, and distinguished chiefly by its oval or oblong-oval leaflets. In his revision of the North American species of *Lespedeza*, Britton stated¹ that "the Linnaean *Hedysarum frutescens* is clearly the same plant [as *L. intermedia* Britton, *L. Stuevei* var. *intermedia* Wats.], as illustrated by the Gronovian specimen on which it is based

¹ Trans. N. Y. Acad. Sci. **12**: 64. 1893.

in the herbarium of the British Museum, bearing the following label, which is the name cited by Linnaeus: 'Hedysarum foliis ternatis subovatis, caule frutescente, Gron. Fl. Virg. 174.' " A. K. Schindler,¹ on the other hand, refers *Clayton* 174, on which Gronovius' reference is based, to *L. violacea* on the basis of its elongate keel, which he considers the only constant distinguishing character of *L. violacea*.² The plant which American authors, following Britton, have called *Lespedeza frutescens*, is considered by Schindler to be merely a variety of *L. virginica*, differing from that plant in its broader obtuse or retuse leaflets, looser branching, and fewer leaves, and is listed as *L. virginica* var. *sessiliflora* (Nutt.) Schindler (l. c. 616). Even if Schindler's reduction of the plant to varietal rank were correct, the name chosen is unfortunate. Nuttall's *L. sessiliflora* is clearly that of Michaux, although the latter's name is not cited under it, and the specimens in Michaux's herbarium, according to both Britton and Schindler, are *L. virginica* (α *typica* of Schindler), although his description³ includes both *L. virginica* and *L. "frutescens."*

The plants currently called *L. virginica* and *L. frutescens* (Schindler's *L. virginica* var. α *typica* and var. β *sessiliflora*) are certainly very closely related, but they are nevertheless almost always readily recognizable in the field and in the herbarium, and may advantageously be retained as species. *Lespedeza "frutescens"* is a more freely and loosely branched plant, with less leafy stems and broader oval or oblong-oval rather than linear or linear-elliptic leaflets, and it frequently has longer peduncles. On the whole, the two plants are quite as well distinguished as other pairs of closely related species in the genus, and it does not seem desirable to follow Schindler in his reduction of *L. "frutescens"* to a variety of *L. virginica*.

¹ Bot. Jahrb. **49**: 591-2. 1913.

² "Das Blütenmerkmal, nämlich die lang hervorstehende Carina, hat er überhaupt nicht beachtet, und doch ist dies, nach dem so überaus reichen Material, das ich untersucht habe, das einzige, weil unter allen Umständen konstante, Merkmal der *L. violacea* gegenüber den verwandten Arten." (Schindler, l. c. 592.) The same character was used in Maximowicz's key (Act. Hort. Petrop. **2**: 358. 1873) to separate *L. violacea* from related species.

³ Michx. Fl. Bor. Am. **2**: 70. 1803.

SESSILIFLORA. *L. erecta*: foliolis oblongis: fasciculis florum sessilibus, numerosis: leguminibus calyce minuto subnudatis, acutis.

HEDYSARUM *junceum*. WALT.

MEDICAGO *virginica*. LINN.

OBS. Variat foliolis latiuscule oblongo-ellipticis et sublinearibus tuncque

HEDYSARO *junceo* congeneri subsimilis.

HAB. in Virginia et Carolina.

Schindler's reference of the type of *Hedysarum frutescens* to *Lespedeza violacea* is based on a character which seems to be really distinctive of this species. Examination of the material in the National Herbarium shows that in *L. violacea* the keel regularly exceeds both the banner and the lateral petals, rarely merely equaling the latter, while in *L. "frutescens"* the keel is distinctly shorter than the lateral petals and the banner. A new name must therefore be found for the plant which has been passing as *Lespedeza frutescens*. Michaux's *L. sessiliflora*, as shown above, included as to description both *L. virginica* and *L. "frutescens."* His specimens preserved at Paris, however, are properly to be taken as the types of his species, and as they are typical *L. virginica* according to both Britton and Schindler,¹ the name *Lespedeza sessiliflora* Michx. must be referred to the synonymy of *L. virginica* (L.) Britton. *Lespedeza reticulata* (Muhl.) Pers. has sometimes been referred to *L. "frutescens,"* but the type in Willdenow's herbarium is *L. virginica* var. *typica*, according to Schindler. The name to be used for *L. frutescens* of authors (for example, Gray's Manual ed. 7 and Britton & Brown's Illustrated Flora) is *LESPEDEZA INTERMEDIA* (Wats.) Britton, Trans. N. Y. Acad. Sci. **12**: 63. 1893, based on *L. Stuevei* var. *intermedia* Wats. in Gray, Manual ed. 6. 141. 1889.

It may be noted in passing that the binomial *Lespedeza frutescens*, commonly quoted from Britton, Mem. Torr. Bot. Club **5**: 205. 1894, had been previously made independently by Hornemann in 1815² (omitted in Index Kewensis), by Elliott³ in 1822, and by de Candolle⁴ in 1825, and that in each case reference is made to the name-bringing synonym *Hedysarum frutescens* L. (except in the case of Hornemann, where the reference is to Willd. Sp. Pl., which is based on Linnaeus). In each case the plant described is *L. capitata* Michx., but on the principle generally followed, at least by American authors, that the application of a name in such cases is to be determined by the name-bringing synonym and not by the description, the combination *Lespedeza frutescens* (L.) should be ascribed to Hornemann.

¹ According to Schindler (l. c. 631) the material in Michaux's herbarium under the name *L. sessiliflora* consists of two specimens of *L. virginica* α *typica* and a capsule of the Old World *L. juncea* (L.) Pers., but the latter is obviously not connected with Michaux's description.

² Hort. Reg. Bot. Hafn. **2**: 699. 1815.

³ Sketch Bot. S. C. & Ga. **2**: 206. 1822.

⁴ Prodr. **2**: 329. 1825.

6. *LESPEDEZA INTERMEDIA* var. **Hahnii**, var. nov. Stem and branches densely hispidulous-puberulous with wide-spreading to somewhat ascending hairs; otherwise as in the typical form.

SPECIMENS EXAMINED: INDIANA: Vicinity of Bascom, August 1906, *W. L. Hahn* (TYPE no. 609738, U. S. National Herbarium).

The typical form of this species is so consistently appressed-puberulous or strigillose on the stem and branches that the form with spreading pubescence seems to merit recognition by name. The specimens examined are closely similar to typical examples of *L. intermedia* in all other features, being densely leafy, with short-petioled leaves of oval retuse leaflets, these strigose beneath, and sessile or subsessile clusters of flowers. The varietal name is given in memory of the collector, Dr. Walter L. Hahn, who died from overexposure in 1911 while serving as naturalist for the Bureau of Fisheries in the Pribilof Islands.

7. *LESPEDEZA HIRTA* var. **appressipilis**, var. nov. Stem and leaves finely pubescent with appressed hairs; leaflets obovate to oval, the larger 1.3–2 cm. long, 5–12 mm. wide, usually retuse, mucronulate.

SPECIMENS EXAMINED: FLORIDA: Dry pine barrens, near Jacksonville, 25 Sept. and 20 Oct. 1896, *A. H. Curtiss* 5780 in part (U. S.); dry pine barrens, Duval Co., October, *Curtiss* 639 (TYPE no. 517623, U. S. National Herbarium); Clarcona, Orange Co., 25 Sept. 1899, *Marie Meislahn* 62 (U. S.).

Like its near relative *L. capitata* Michx., *Lespedeza hirta* (L.) Hornem. is a very variable species. The variety here distinguished as new, chiefly on the nature of its pubescence, grades into the typical spreading-pilose *L. hirta* through various specimens from the Southern States. It is also closely allied to *L. angustifolia* (Pursh) Ell., agreeing with it in pubescence and differing chiefly in its broader obovate or oval leaflets. No intermediate specimens connecting it with *L. angustifolia* have been seen.

Lespedeza angustifolia var. *brevifolia* Britton, Trans. N. Y. Acad. Sci. 12: 68. 1893, based on material collected by Chapman in Florida, seems scarcely distinct enough from typical *L. angustifolia* to require recognition in nomenclature. A sheet of the type material lent from the New York Botanical Garden herbarium, collected at Campbellton, western Florida, by Dr. Chapman, has the leaflets of the middle leaves up to 2.2 cm. long and 2.5 mm. wide, thus no shorter than is common in leaves of the middle portion of the stem in this species.

8. Since the time of Torrey & Gray,¹ the primary division of the native American species of *Lespedeza* has been into two groups; one (Section *Eulespedeza* Torr. & Gray), with two kinds of flowers (complete but usually infertile flowers in pedunculate to sessile racemes or clusters, and apetalous but very fertile flowers, these either in sessile axillary clusters or intermixed with the petaliferous ones), calyx usually much shorter than the corolla and pod, and violet or purple corollas; the other (Section *Lespedezaria* Torr. & Gray) with the flowers all alike and complete in dense spikes or heads, calyx as long as the pod or longer, and whitish or ochroleucous corollas bearing a purple spot on the banner. These two groups are for the most part well defined, although apparently connected by the two little-known species *Lespedeza Manniana* and *L. simulata* Mackenzie & Bush. These have much the appearance of *L. capitata*, with an inflorescence of petaliferous flowers more like that of species of the *Eulespedeza* group, and axillary clusters of apetalous flowers; the sepals are long, as in the *L. capitata* group, and the flowers purple as in the *Eulespedeza* group.

In his paper on the genus Schindler pointed out that one of the traditional differences between the two groups of American species—the presence of cleistogamous flowers in the purple-flowered species, and their absence in the whitish-flowered species—has no existence in nature. He states² that he has been able to determine the presence of “apopetale Blüten mit parthenogonischen Früchten” in *L. hirta* (in which he includes as a variety *L. angustifolia*) and *L. capitata*. In the specimens of *L. hirta*, *L. capitata*, and *L. angustifolia* examined, I have found no flowers with corolla and stamens so greatly reduced as is common in the purple-flowered species. In all three species, however, it is easy to find intermixed in the spikes cleistogamous flowers with reduced corolla, strongly hooked style, very short staminal sheath, and anthers dehiscing in the bud. The fruits of these cleistogamous flowers can be distinguished by the very short sheath of the persistent stamens and the short hooked style, often with a stamen adhering to the stigma. In the very distinct *Lespedeza leptostachya* Engelm.,³ the remaining species of this group, the flowers, while

¹ Fl. N. Amer. 1: 366–369 1840.

² Bot. Jahrb. 49: 574. 1913

³ The leaves of all Lespedezas are regularly pinnately 3-foliolate. Two specimens of *L. leptostachya* in the National Herbarium bear single 4-foliolate leaves and one of them has a 5-foliolate leaf. These abnormal leaves represent a combination of the pinnate and ditate modes, the terminal leaflet being borne on a short rachis, the others merely petiolulate at the apex of the petiole.

complete, are apparently usually cleistogamous. In the eight sheets examined in the National Herbarium, all collected in Emmet County, Iowa, by R. I. Cratty, very few flowers with fully developed corolla and stamens have been found.

In the purple-flowered group all gradations exist between the nearly or quite apetalous flowers, with stamens greatly reduced or perhaps sometimes entirely wanting, and the petaliferous flowers. The presence of cleistogamous flowers in all four species of the *L. hirta* group, and their extreme development in *L. leptostachya*, make it necessary to abandon this character in the future in distinguishing our two groups of species.

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REPORTS ON THE FLORA OF THE BOSTON
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COMPOSITAE.

ACANTHOSPERMUM.

A. AUSTRALE (Loefl.) Ktze. See RHODORA ix. 26, 1907. Cabbage field, from woolwaste, Lawrence (*Mrs. E. S. Schneider*, no date); S. Boston flats (*C. E. Perkins*, (?) Sept. 25, 1881).

ACHILLAEA.

A. LANULOSA Nutt. Dry sandy soil, rare; Newbury, Manchester, Revere, Malden, Wellesley, Readville.

A. MILLEFOLIUM L. Dry fields and roadsides, very common throughout.

A. PTARMICA L. Moist soil, spontaneous in gardens and escaped; Danvers, Lynn, Salem, Jamaica Plain.

A. TOMENTOSA L. Woolwaste, Westford (*Miss E. F. Fletcher*, 1884 et seq.). Specimen in herb. Gray. See RHODORA x. 127, 1908.

AGERATUM.

A. HOUSTONIANUM Mill. (*A. mexicanum* Sims.) Lynn (*E. & C. E. Faxon*, Sept. 23, 1880). Specimen in herb. Gray. Native of Mexico.